Women & Health

ISSN: 0363-0242 (Print) 1541-0331 (Online) Journal homepage: http://www.tandfonline.com/loi/wwah20

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To cite this article: Subash Thapa, Nirmala Bista, Karin Hannes, Anne Buve, Mieke Vermandere & Catharina Mathei (2015): Vulnerability of Wives of Nepalese Labor Migrants to HIV Infection: Integrating Quantitative and Qualitative Evidence, Women & Health, DOI: 10.1080/03630242.2015.1118726

To link to this article: http://dx.doi.org/10.1080/03630242.2015.1118726

Vulnerability of Wives of Nepalese Labor Migrants to HIV Infection: Integrating Quantitative and Qualitative Evidence

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Running head: HIV infection among wives of labor migrants in Nepal

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Key words: HIV infection; mixed-method study; Nepal; risk factor; social epidemiology; wives of labor migrants.

Received: 24 Nov 2014

Revised: 24 Jul 2015

Accepted: 04 Aug 2015

Conflict of interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

ABSTRACT

HIV risk is determined by the interaction between social and individual risk factors, but information about such factors among Nepalese women is not yet understood. Therefore, to assess the risk factors and vulnerability of the wives of Nepalese labor migrants to HIV infection, we conducted a mixed-methods study in which a descriptive qualitative study was embedded within a case-control study. We interviewed 224 wives of labor migrants in the case-control study, and conducted two focus group discussions (n=8 and 9) in the qualitative study. We found that illiteracy, low socio-economic status and gender inequality contributed to poor knowledge and

poor sexual negotiation among the wives of labor migrants and increased their risk of HIV through unprotected sex. Among male labor migrants, illiteracy, low socio-economic status, migration to India before marriage and alcohol consumption contributed to liaisons with female sex workers, increasing the risk of HIV to the men and their wives through unprotected sex. Both labor migrants and their wives feared disclosure of positive HIV status due to HIV stigma and thus were less likely to be tested for HIV. HIV prevention programs should consider the interaction among these risk factors when targeting labor migrants and their wives.

KEY WORDS: HIV infection; mixed-methods study; Nepal; vulnerability; wives of labor migrants.

INTRODUCTION

The United Nations Program on HIV and AIDS (UNAIDS, 2007) estimated that 17.7 million women had been infected with HIV, comprising almost half of the total global population that was infected with HIV. In Nepal, HIV has evolved from a low prevalence to a concentrated epidemic among high-risk groups, such as male labor migrants, female sex workers and men having sex with men (Department of Health Service, 2014). Of the total population infected with HIV in Nepal, male labor migrants account for 10%, and the general female population accounts for 30%. The general female population comprises the fastest-growing HIV-infected population, especially in the rural areas (Department of Health Service, 2014).

Nepal is a very poor country with wide disparities and variations in development indicators within the country (UNDP 2014). Because of limited work opportunities in

Nepal and the open-border provision between Nepal and India, 1.5 to 2 million Nepalese work in India, and a great majority of these labor migrants are from the far-western region of Nepal (FWRN) (Poudel et al.,, 2004). Nepalese laborers in India mostly work in Andhra Pradesh and Maharastra, where 18 to 25% of female sex workers are infected with HIV (Ramesh et al., 2008). Some of these laborers from the FWRN engage in unprotected sex in India, often with female sex workers, and become infected with HIV (Poudel et al., 2004). Through extramarital sexual relationships and subsequent vertical transmission, labor migrants may transmit HIV to their wives and ultimately to their children and potentially to the wider population in the FWRN.

To understand HIV in women, Higgins et al. (Higgins, Hoffman, & Dworkin, 2010) have proposed using a vulnerability paradigm that accounts for women's susceptibility to HIV infection as a consequence of socio-economic and cultural factors, such as poverty, illiteracy and gender inequality. Today, 70% of global transmissions of HIV occur between a man and a woman, and preventive programs largely fail due to the lack of information related to women's vulnerability to HIV infection (UNAIDS, 2008).

In Nepal, several epidemiologic studies on the risk of HIV among women from migrant communities (New ERA, 2010; Smith-Estelle & Gruskin, 2003; Thapa, Bista, Timilsina, Buntinx, & Mathei, 2014) have used only quantitative methods and neglected to examine socio-economic and cultural factors that would have helped to understand the mechanisms involved in the transmission of HIV. A mixed-methods study is generally acknowledged to present a richer picture of the phenomenon under study (Creswell & Plano Clark, 2007). Whereas quantitative studies identify the

magnitude of association of risk factors for HIV infection, qualitative data clarify the nature of the observed relations, facilitating the translation of the findings into policy and practice**.** Therefore, we used a mixed-methods design with a qualitative study embedded within a quantitative case-control study to explore and understand the risk factors and vulnerability of a potentially high-risk group, namely the wives of labor migrants, to HIV infection in the FWRN.

METHODS

This study was conducted in Achham, a hilly district in the FWRN with the highest number of people living with HIV in Nepal (Department of Health Service, 2014). Our mixed-methods study design included a matched case-control study (quantitative) and a descriptive case study (qualitative), conducted in parallel. The descriptive case study was embedded within the case-control study and was considered to provide a supportive secondary role by supplementing the quantitative findings in an in-depth way (Creswell & Plano Clark, 2007). The women included in the case-control study were not included in the focus group discussions because we wanted to talk to women who were not influenced by any questions from the interview. Ethical consent for the study protocol was provided by the Ethical Review Committee of Nepal Institute of Health Sciences, Kathmandu, Nepal; National Center for AIDS and STD Control, Kathmandu, Nepal and District Health Office, Achham, Nepal.

Quantitative Data

Participants: Women who tested positive for HIV, were aged 18 years of age or older and who were married to a husband who had worked abroad for six months to two years were defined as cases. Women who had tested negative for HIV within the previous year, were aged 18 years of age or older and who were married to a husband who had worked abroad for six months to two years were defined as controls. Women living abroad with their husbands and wives of cross-border workers were excluded because these women might have lived with their husbands, and the husbands may have been less likely to be engaged in risky behaviors.

Recruitment Procedure: Participants were recruited based on register records from the HIV counseling and testing (HCT) centers and the district health office (DHO) in Achham. The HCT register was reviewed to identify the HIV status of the women who had an HIV test during the period from January 2, 2009 to January 31, 2013. The list of women who tested positive in the HCT register was checked against the list of women living with HIV in the DHO register. The women who were found in the HCT register but not in the DHO register were not included for sampling, as the women might have died, lost contact or migrated to another place. Of the 651 women who tested positive for HIV and met the inclusion criteria, 112 cases were randomly selected. For each case, one control matched on age category (5-year interval), and the age category at marriage (5-year interval) was randomly selected from 1,291 women who were listed in the HCT register as having tested negative for HIV within the previous year. Due to geographic difficulties, lack of transportation service in Achham, and the limited time frame available to conduct the study, we

were only able to include only 112 cases and 112 controls, which could have resulted in inadequate statistical power to detect some meaningful differences as statistically significant. The information about HIV status of the women was kept strictly confidential.

All of the selected women, both those who tested positive and those who tested negative, were then visited at their homes and asked about their husbands' migratory history to confirm whether they met the inclusion criteria, and, if confirmed, they were invited to participate in the study. All of the contacted women met the inclusion criteria. The Community and Home-Based Care team, consisting of local prevention workers from the two local Non-governmental organizations (NGOs), namely 'Working for Access-Nepal' and 'Gangotri Grameen Bikash Manch', helped us to approach the women in their homes. Some of the women were not home during our visit and were interviewed in the Anti-Retroviral Treatment center when they visited for their follow-up. Otherwise, we repeated the visits until we found the women at home. The participation rate was 100% among all of those invited.

Data Collection: A structured questionnaire was prepared in English based on a review of the literature. Then, the questionnaire was translated into Nepali by two individual researchers simultaneously, and a third researcher compared the two versions and made all the necessary reconciliations of differences in translation. The questionnaire was pretested among clients attending a HCT clinic in Kathmandu. We translated some Nepali words into the local dialect by consulting the local prevention workers to avoid misinterpretation of the questions. As the majority of women in

FWRN were illiterate, a verbal informed consent procedure was completed before the interview.

Study variables: We assumed that the nature of the variation in social and individual factors of wives and the sexual behavior of labor migrants abroad might be associated with the wives of labor migrants being HIV-positive. Therefore, questions about the following wife-related socio-demographic factors were developed and included: caste (upper/lower); literacy (illiterate/literate); occupation (farming/non-farming); income from agriculture (no production/enough for less than six months/enough for more than six months); alternative sources of income (yes/no); family type (nuclear/joint); marital status (widowed/non-widowed); and cause of death of a husband (AIDS-related illness/others). A nuclear family was considered to be one pair of adults and their children. For the purpose of multivariable analyses, higher income was defined as having an income from agriculture sufficient for at least 12 months of living or earning at least US$ 1 per day in a primary job or alternative sources of income.

Questions about the following factors related to wives' HIV-related knowledge and behavior were developed and included: heard about HIV/AIDS (yes/no); knowledge about HIV prevention (abstinence/being faithful to only one partner/condom use); knowledge about HIV transmission (sharing used needles/blood transfusion/from infected mother to child); heard about a condom (yes/no); knowledge about properly using a condom (yes/no); heard about sexually transmitted infections (STIs) (yes/no); any close relatives who died of HIV/AIDS (yes/no); keep whether someone was infected with HIV in the family a secret (yes/no); take care of someone infected with HIV in the family (yes/no); personal HIV risk perception before testing for HIV

(yes/no/don't know); age at first sexual intercourse (yes/no); and duration of sexual activity (less than 10 years/10 years and more); opinion regarding an HIV test (should be voluntary/should be mandatory); last sexual intercourse (with husband/with other men); and ever used a condom with husband (yes/no). The women were also asked whether they knew about HIV/AIDS, condoms and STIs before they were tested for HIV. For the purpose of multivariable analyses, the women who had heard about HIV/AIDS and knew of at least one mode of HIV transmission were categorized as having some knowledge about HIV. Likewise, the women who had heard of condoms and who knew how to use a condom properly were categorized as having some knowledge about condoms.

The following husband-related factors were included: literacy status (illiterate/literate); migration before marriage (yes/no); age when going abroad for the first time (less than 16 years/16 to 24 years/25 to 32 years/32 years and more); income abroad (less than $ 2.60 per day /$ 2.60 per day and more); type of work done abroad (watchman/driver or automobile cleaner/hotel staff/industry worker/don't know); any alcohol consumption (yes/no); country of migration (India/other than India); living status abroad (alone/with friends/with relatives/with family members/with others); and having an unpaid sexual partner abroad (yes/no).

Data Analysis: Analyses were performed using SPSS 18.0 for Windows. Chi square statistics were used to compare the proportions between the cases and controls. P-values of ≤ 0.05 were considered to be statistically significant. Hierarchical conditional logistic regression analysis was performed to identify factors that were independently associated with HIV infection.

In the first step of the multivariable analyses, wife-related socio-demographic variables were entered into the model (Model 1). Next, variables related to wives' HIV-related knowledge and behavior were added into the model (Model 2) to examine whether the socio-demographic factors associated with the HIV-positive status of women was through mediation by knowledge and behavior. Finally, we added husband-related factors into the model (Model 3) to observe whether the women's HIV-positive status was associated with husband-related factors. Variables, such as the women's marital status, variables related to husband's death and opinions about HIV testing were not included in the multivariable analyses model because they were not considered to be exposure variables but were instead considered to be consequences of HIV infection. Variables related to risk perception and condom use were also not entered into the multivariable analyses model due to small numbers in some cells. A *p* value significance of less than 0.10 was required to be entered into the model, and a value of less than 0.10 was required to remain in the model. The fit of model was tested using the Hosmer and Lemeshow goodness-of-fit test.

Qualitative data

Participants: Within the limited timeframe and limited number of women available, we organized two focus group discussions (FGDs), one with wives of labor migrants living with HIV and one with wives of labor migrants who had tested negative for HIV. *Recruitment Procedures:* Given the lack of transportation facilities in Achham, we were somewhat limited in options for recruiting participants. We, therefore, approached women who visited the Mangalsen Hospital for a CD4 cell count for FGD-1. On the day of FGD-1, nine women showed up for the test, and all of them

met the inclusion criteria and all were invited for the discussion. The participation rate was 100%.

Women who tested negative for HIV were recruited for FGD-2 in a monthly meeting of the poverty alleviation fund, a community level (microfinance) organization run by women. We consulted with the local prevention workers to identify in the meeting the wives of labor migrants who tested negative for HIV. These local prevention workers lived nearby in the community and knew most of the wives of the labor migrants through personal and professional contacts. Eight women met the inclusion criteria, and all agreed to participate in the FGD.

Data Collection: An interview guide was prepared in English and then translated into Nepali. We translated some Nepali words into the local dialect to avoid misinterpretation of the questions. The original version in English and the translated version in Nepali were then checked with the local prevention workers who were familiar with English, Nepali and the local dialect, and discrepancies were reconciled. The second author moderated both of the FGDs. She is well-trained in qualitative research and is from Achham, which makes her familiar with the local language and culture. Because the women of Achham would not normally talk openly about sexual matters with an unfamiliar man, this female researcher was involved to generate more comfort and hopefully more authentic information.

To minimize the participants' fears and anxieties about disclosing personal information related to sexual behaviors and HIV-positive status, the FGDs were conducted privately in one of the rooms of the Trainee Residence House of the DHO in Achham. A verbal informed consent procedure was completed with each

participant. The participants were also asked for their consent to tape record the discussion. The participants were provided refreshments after the discussions.

Data Analysis: We opted for a thematic approach to data analysis and used Nvivo-10 software to support the analysis. All of the recordings of the FGDs were transcribed verbatim after each discussion. A parallel translation was conducted to assure quality control of the translations. Two individual researchers translated the recordings simultaneously, and a third researcher compared the two versions and made all of the necessary reconciliations. Two individuals also coded all of the transcripts independently, reconciling discrepancies, and then a senior researcher with expertise in qualitative research checked the codes for over- or under-interpretation. Conceptual subthemes that emerged from the data were created from the initial codes based on repeating ideas that were similar in meaning and the relationships that formed between the codes (fig 1).

RESULTS

Quantitative Findings

The results of the bivariate analyses revealed that cases were significantly more likely than controls to belong to the lower caste, to be illiterate, to have had income from agriculture that was insufficient to sustain them for more than six months, to have no alternative sources of income and to live in a nuclear family (Table 2). Compared with controls, the cases were significantly more likely to be widowed, to know about

the cause of their husband's death and to have had a husband who died of AIDS-related illnesses.

Cases were significantly less likely than controls to have heard about HIV, to know about ABC prevention (Abstinence, Be faithful to only one partner and Condom use) and to know about the transmission routes (Table 3). Likewise, the cases were significantly less likely than controls to have heard about condoms and to have heard about STIs. Compared with controls, cases were more likely to have close relatives who had died of AIDS-related illnesses, keep a family member's HIV-positive status secret, neglect HIV-positive family members and perceive themselves as being at low risk of HIV. Cases were significantly more likely than controls to have had their first sexual intercourse before 18 years of age, to have been sexually active for a longer period and to have the opinion that an HIV test should be mandatory. Five cases had their last sexual intercourse with other men, while all of the controls had had their last sexual intercourse with their husbands. Free condoms were available within 30 minutes walking distance for the majority of the women. However, only 3 of 112 cases and 21 of 112 controls used condoms with their husbands. The most cited reason for not using a condom was the husband's refusal among the cases and a feeling of no need among the controls. The majority of cases did not experience any changes in the behavior of their family, society and health workers after disclosing their HIV status.

The results of the bivariate analyses also revealed that a significantly higher proportion of the husbands of the cases compared with the husbands of controls were illiterate, migrated before marriage, migrated at older age, earned less abroad, worked

as watchmen and were employed in India (Table 4). Similarly, the likelihood of consuming alcohol, living alone and having an unpaid sexual partner abroad was significantly higher among the husbands of the cases than among the husbands of the controls.

The results of the hierarchical conditional logistic regression analysis showed that lower caste, illiteracy and lower income of the women were independently positively related to being HIV-positive in Model 1 (Table 5). In Model 2, lower caste, lower income, poor knowledge about HIV/AIDS and having heard of STI were independently positively associated with women's HIV-positive status. In Model 3, lower caste, lower income and poor knowledge about HIV/AIDS were independently positively associated with HIV-positive status. Migrating before marriage, migration to India and alcohol consumption were the husband-related factors independently positively associated with women's HIV-positive status.

Qualitative Findings

Societal-level Risk Factors

Illiteracy and Low Socio-economic Status (SES): All of the women from both groups explained that they were poor, illiterate and economically dependent on their husbands. Some women reported working on farms, but the earnings were not sufficient to support a decent living. Some women living with HIV reported becoming poorer after their husbands' deaths and also because of high treatment expenses. One woman opined that poorer women were more likely to become involved in survival sex, and this could transmit HIV in the society.

Most of women in both groups also described the lack of labor jobs in Nepal and illiteracy as the reasons for men's migration.

"Men who come from India not only transmit HIV to their wives but also to other women. Women here are poorer than men, and they might go for sex with men for small amount of money. HIV could spread through these men in the society." *(FGD-1, Participant no. 5)*

Gender Inequality: Most of the women in both groups explained that they were physically and verbally abused by their husbands, specifically when refusing to have sex or asking their husbands to use a condom. Some of the women who tested negative for HIV mentioned that they could neither ask their husbands to go get an HIV test nor refuse sex. Some of the women in both groups mentioned that their husbands were not convinced of the need to use a condom or to get an HIV test.

Social Stigma: Most of the women living with HIV described that they were stigmatized within their family and the society. These women were shamed in public, given nicknames based on their HIV status, ignored in the family and excluded from social ceremonies. One of the women reported being blamed by their husbands and mothers-in-law for bringing HIV into the family.

Some of the women living with HIV said that their family members were also discriminated against due to their HIV status; for example, their children were separated at school, and the teachers threatened them about coming to school.

"People call me *MAREL* (*local dialect to denote somebody who will die soon*) because I am a widow, and I am dying soon of AIDS. My child is called *MAREL*'s son." *(FGD-1, Participant no. 2)*

Individual-level Risk Factors

Poor Knowledge about HIV/AIDS: Most of the women infected with HIV reported not being aware of HIV and protected sex before they were diagnosed with HIV. Some of the women who tested negative for HIV knew about HIV/AIDS, different modes of transmission and also about transmission due to unprotected sex with their husbands. A few women from both groups suspected that women from rural villages were still unaware about condom use and HIV testing.

Some of the women infected with HIV reported that their husbands were also unaware of HIV and protected sex before they were diagnosed with HIV. Some women from both groups suspected that many couples did not know how to use a condom properly.

Low Risk Perception: Some of the women living with HIV did not perceive themselves to be at risk before they were diagnosed with HIV and also trusted their husbands. Other women living with HIV doubted their husband's behavior and mentioned that the husbands deceived them by lying about their HIV status and sexual behavior. However, some of the women who tested negative for HIV explicitly reported that they perceived themselves as being at risk of HIV and strongly doubted their husband's behavior.

Fear of Disclosure and Late Testing: All of the women living with HIV reported having been tested after their husband's death or after their husbands tested positive for HIV. However, some of the women who tested negative for HIV said that they were tested after their husband's return, in cases of minor illnesses and during pregnancy.

Most of the women living with HIV stated that their husbands were afraid of HIV testing and disclosing an HIV-positive status. They mentioned that the men only received testing when they were close to dying and that it usually took about 10 months to 2 years after their return back home from India. A woman living with HIV mentioned that her husband's non-disclosure of his HIV status was one of the reasons that he transmitted HIV to her.

"My husband had a fever and cough for a long time. He used to sleep in the house drinking alcohol. (….) He never agreed to go to hospital. I did not know about this new illness (HIV)." *(FGD-1, Participant no. 6)*

Unprotected Sex with Husband: A few women mentioned that most women in the community did not use condoms, although condoms were easily available and free of cost. Only one woman mentioned using a condom in the past for family planning purposes.

Most of the women in both groups reported that their husbands did not want to use condoms because of the perception that it would decrease their sexual pleasure. Some of the women living with HIV mentioned that their husbands visited brothels in

India and that unprotected sex with their husband was the reason why they became infected with HIV.

Integrating Quantitative and Qualitative Findings

We developed a framework (Figure 1) that explained the interaction between social and individual factors associated with HIV risk of participating Nepalese women. To develop the framework, we first identified the determinants of HIV infection in women from the quantitative and qualitative findings of our study. Then, we conducted a review of theoretical and empirical literature to determine whether our study findings supported or contrasted with previous findings and also to understand the causal relationship of those factors determining related to women's HIV risk status in similar contexts.

The framework suggested that factors at the societal level might operate through different pathways related to the behavior of the wives of labor migrants and consequently their risk of contracting HIV. First, illiteracy and low SES mediated through poor knowledge to prevent wives of labor migrants from using condoms and eventually increasing their HIV risk. Second, illiteracy and low SES, along with gender inequality, complicated the negotiation process between these women and their husbands of using condoms or being tested for HIV, increasing their HIV risk. Third, among male labor migrants, illiteracy and low SES operating through poor knowledge about HIV/AIDS further contributed to their liaisons with female sex workers, to not being tested for HIV, and to continue having unprotected sex. Fourth, illiteracy and low SES among men associated with migration to India, migration

before marriage and alcohol consumption, further contributed to liaising with female sex workers, increasing the risk of HIV in their wives through subsequent unprotected sex. Lastly, HIV stigma was highly feared among the labor migrants and their wives. Therefore, many of them opted out of being tested because of the potential risk that their HIV status might be disclosed. This fear put the wives of labor migrants at risk of HIV though unprotected sexual behavior.

DISCUSSION

To our knowledge, this is the first mixed-methods study conducted in Nepal to explore and understand the risk factors and vulnerability of the wives of labor migrants for HIV infection. We found that illiteracy, low SES, gender inequality, migration of men to India and HIV stigma were the social factors that interacted with individual's knowledge and behavior to determine women's vulnerability to HIV infection in the FWRN.

Studies conducted in Africa after 1996 have shown positive associations of illiteracy and low SES with HIV infection (Hargreaves et al., 2008), and this finding was also well-supported by the results of our study. The women's literacy did not appear to be significant in our multivariable analyses after knowledge about HIV/AIDS was entered into the model, suggesting that illiteracy was mediated through poor knowledge of HIV/AIDS to increase the risk of HIV infection through unprotected sex. Although low SES did not mediate through poor knowledge in our study, several studies (Gillespie, Kadiyala, & Greener, 2007; Gregson et al., 2005) elsewhere have reported that low SES also contributed to poor knowledge through

limiting access to HIV/AIDS-related information. Poor knowledge among the women in our study might also have contributed to low risk perception being associated with HIV infection.

Our qualitative findings supported that illiteracy and low SES made women socially and economically dependent on their husbands and made it difficult to negotiate for condom use and HIV testing. A study from South Africa (Lurie et al., 2003) has reported that illiteracy and low SES among women from migrant communities not only contributed to poor knowledge and poor sexual negotiation but also to involvement in survival sex. Our quantitative findings revealed that more than two-thirds of the wives of labor migrants living with HIV were widowed. From our qualitative findings, we learned that the women had poor economic status after their husband's deaths. Because of their precarious economic situation, these women were more likely to become involved in survival sex, which might have led to transmission of HIV to a wider population. However, this information has not yet been verified by any other studies in Nepal.

Several studies from Africa (O'Brien & Broom, 2013) and Asia (Jesmin & Cready, 2014) have identified an association between gender inequality and the risk of HIV infection among women. This causal relationship between gender inequality, women's inability to negotiate safer sex and risk of HIV infection was also supported by our qualitative findings. In our case-control study, more cases than controls mentioned that an HIV test should be mandatory. This finding might imply that women in the FWRN might have been restricted in being tested voluntarily for HIV.

The Nepalese cultural context might promote gender inequality, as most women perceive themselves to be subordinate to their husbands.

Women's risk of HIV infection is at least partially determined by the risky behaviors of their husbands. Mishra (Mishra et al., 2007) has reported that men's HIV risk might be a consequence of higher SES because more money equates with more opportunities for paid sex. However, Bloom et al. (Bloom & J, 2001) argued that men's HIV risks were associated with lower SES because poorer populations might not be aware of the risks of HIV and might not have access to HIV prevention. This latter finding was well-supported by our study. Additionally, low SES in men brought consequences, such as migration to India and migration before marriage, and both of these factors were independently associated with women's HIV-positive status in our study. Bam (2013) has reported that Nepalese migrants with lower income visited cheaper brothels in India, and female sex workers working in these cheaper brothels were more likely to be HIV positive. Li (2010) has noted that clients and female sex workers in India persuaded each other to drink alcohol, and heavy alcohol consumption increased HIV-related risky behaviors (Kalichman, Simbayi, Kaufman, Cain, & Jooste, 2007). Alcohol consumption has traditionally been linked with lower SES in Nepal (Bennett, Dahal, & P, 2008), and heavy alcohol consumption in males was independently associated with women's HIV-positive status in our study.

HIV stigma was assessed both quantitatively and qualitatively in our study. Our quantitative findings identified no changes in the behaviors of family, society and health workers after HIV disclosure in women. However, our qualitative findings revealed that both enacted and felt stigma often were faced by women living with

HIV. These contrasting findings might be due to the fact that the FGDs were conducted in a private place where the women felt free to discuss their experiences. This finding signifies that future research on HIV stigma should consider the techniques and places of data collection to ensure the reliability of the information collected.

HIV stigma acts as a barrier for HIV testing and disclosure in both men and women (Young & Bendavid, 2010), and this result was supported by our qualitative findings. In Nepal, the fear of disclosure may be enhanced due to the lack of confidentiality during testing, referral and treatment (Devkota, 2010). On the other hand, partner notification of a positive HIV status is very low in Nepal. In these circumstances, HIV-positive men and women might continuously engage in unprotected sex with their partners to prevent suspicion and thus promote HIV transmission.

Study Limitations

This study had several limitations. First, our study included only the wives of labor migrants who were tested for HIV and who were within reach of NGOs. Wives of labor migrants who were not tested and were out of reach of NGOs were not included. Therefore, selection bias was possible. Second, results from the case-control study were based on behaviors reported in the interviews with women; thus, recall bias and social desirability bias were possible. Third, due to the cross-sectional nature of the case-control study design, inference of casualty among variables was precluded. Fourth, the quantitative analysis had a relatively small sample size and thus low statistical power to detect as statistically significant variables that were

related to risk perception and condom use behavior that were associated with women being HIV-positive. Fifth, due to small sample size in the qualitative portion, saturation of themes may not have been achieved. Sixth, standard instruments were not used for some of the data collection, which could have resulted in misclassification of information and lack of comparability to other studies that have used standard instruments. Finally, the study sample might have lacked representativeness due to the methods used to select the study sample, thus reducing the generalizability of results.

Our use of a mixed-methods study design, however, enabled the potential weaknesses of the quantitative study to be complemented by the qualitative study and vise-versa. For example, the problem of low statistical power for detecting risk perception and condom use behavior in the quantitative analysis was partially ameliorated by information being provided in the qualitative study. The most important advantage of using a mixed-methods design was that it enabled us to develop a framework to illustrate the multi-factorial risk factors for HIV infection among women.

Implications for Policy and Practice

To reduce women's vulnerability to HIV infection in Nepal, interventions targeting both the general population and specific sub-populations, including labor migrants and their wives, should be combined. The general population interventions should include programs, such as access to basic education and micro-financing programs to create better employment opportunities inside Nepal for both women and men. Likewise, mass awareness programs for HIV prevention would be likely to improve

knowledge about HIV prevention, which might combat social stigma for HIV, reducing people's fear of being tested for HIV.

The targeted interventions should include programs to reduce gender inequality for women and programs to prevent risky sexual behaviors among seasonal migrant laborers who work in India. Networking and providing gender-related training to local women's groups might help women to identify and challenge gender inequalities in their daily life. Moreover, involving men in different HIV-related committees, such as HIV-related community support groups, might increase communication between men and women and help women to negotiate safer sex. Providing individual or group counseling to seasonal labor migrants who work in India about HIV risks associated with heavy alcohol consumption and unprotected sex with female sex workers might reduce risky HIV-related behaviors. To gain a better understanding of women's HIV risks and improve the comprehensiveness of the framework, future research is highly encouraged.

Acknowledgements

The authors express special appreciation to Working for Access, Achcham, Nepal; Gangotri Grameen Bikash Manch, Achcham, Nepal; Mangalsen Hospital, Achcham, Nepal; Department of Public Health, Nobel College-Pokhara University, Kathmandu, Nepal; Department of Public Health, Nepal Institute of Health Sciences, Kathmandu, Nepal and National Center for AIDS and STD Control, Kathmandu, Nepal for their considerable help during the field-work of this study.

REFERENCES

Bam, K., Thapa, R., Newman, M. S., Bhatt, L. P., & Bhatta, S. K. (2013). Sexual behavior and condom use among seasonal Dalit migrant laborers to India from Far West, Nepal: a qualitative study. *PloS One*, *8*(9), e74903. doi:10.1371/journal.pone.0074903

Bennett, L., Dahal, D. R., & P, G. (2008). *Caste, Ethnic and Regional Identity in Nepal: Further Analysis of the 2006 Nepal Demographic and Health Survey*. Calverton, Maryland, USA.

Bloom, D. E., & J, S. (2001). *Health, wealth, AIDS, and poverty. In: Report of the Asia-Pacific Ministerial Meeting*. Melbourne, Australia.

Creswell, J. W., & Plano Clark, V. L. (2007). *Designing and conducting mixed methods research. Applied Linguistics* (Vol. 2nd). doi:10.1111/j.1753-6405.2007.00096.x

Department of Health Service. (2014). *Annual report: Department of health service 2012/2013*. Kathmandu, Nepal.

Devkota, B. (2010). Assessment of voluntary counseling and testing services on STIs and HIV/AIDS in selected districts of Nepal. In *6th IAS conference on HIV pathogenesis and treatment* (p. CDD296).

Gillespie, S., Kadiyala, S., & Greener, R. (2007). Is poverty or wealth driving HIV transmission? *AIDS (London, England)*, *21 Suppl 7*, S5–S16. doi:10.1097/01.aids.0000300531.74730.72

Gregson, S., Nyamukapa, C. A., Garnett, G. P., Wambe, M., Lewis, J. J. C., Mason, P. R., … Anderson, R. M. (2005). HIV infection and reproductive health in teenage women orphaned and made vulnerable by AIDS in Zimbabwe. *AIDS Care*, *17*(7), 785–94. doi:10.1080/09540120500258029

Hargreaves, J. R., Bonell, C. P., Boler, T., Boccia, D., Birdthistle, I., Fletcher, A., … Glynn, J. R. (2008). Systematic review exploring time trends in the association between educational attainment and risk of HIV infection in sub-Saharan Africa. *AIDS (London, England)*, *22*(3), 403–14. doi:10.1097/QAD.0b013e3282f2aac3

Higgins, J. A., Hoffman, S., & Dworkin, S. L. (2010). Rethinking gender, heterosexual men, and women's vulnerability to HIV/AIDS. *American Journal of Public Health*, *100*(3), 435–45. doi:10.2105/AJPH.2009.159723

Jesmin, S. S., & Cready, C. M. (2014). Can a woman refuse sex if her husband has a sexually transmitted infection? Attitudes toward safer-sex negotiation among married women in Bangladesh. *Culture, Health & Sexuality*, *16*(6), 666–82. doi:10.1080/13691058.2014.901561

Kalichman, S. C., Simbayi, L. C., Kaufman, M., Cain, D., & Jooste, S. (2007). Alcohol use and sexual risks for HIV/AIDS in sub-Saharan Africa: systematic review of empirical findings. *Prevention Science : The Official Journal of the Society for Prevention Research*, *8*(2), 141–51. doi:10.1007/s11121-006-0061-2

Li, Q., Li, X., & Stanton, B. (2010). Alcohol use among female sex workers and male clients: an integrative review of global literature. *Alcohol and Alcoholism (Oxford, Oxfordshire)*, *45*, 188–99. doi:10.1093/alcalc/agp095

Lurie, M. N., Williams, B. G., Zuma, K., Mkaya-Mwamburi, D., Garnett, G. P., Sweat, M. D., … Karim, S. S. A. (2003). Who infects whom? HIV-1 concordance and discordance among migrant and non-migrant couples in South Africa. *AIDS (London, England)*, *17*(15), 2245–52. doi:10.1097/01.aids.0000088197.77946.ba

Mishra, V., Assche, S. B.-V., Greener, R., Vaessen, M., Hong, R., Ghys, P. D., … Rutstein, S. (2007). HIV infection does not disproportionately affect the poorer in sub-Saharan Africa. *AIDS (London, England)*, *21 Suppl 7*, S17–28. doi:10.1097/01.aids.0000300532.51860.2a

New ERA. (2010). *Integrated biological & behavioral surveillance survey among the wives of migrants in four districts of far-western Nepal round II*.

O'Brien, S., & Broom, A. (2013). Gender, culture and changing attitudes: experiences of HIV in Zimbabwe. *Culture, Health & Sexuality*, *15*, 583–597. doi:10.2307/23524702

Poudel, K. C., Jimba, M., Okumura, J., Joshi, A. B., & Wakai, S. (2004). Migrants' risky sexual behaviours in India and at home in far western Nepal. *Tropical Medicine & International Health : TM & IH*, *9*(8), 897–903. doi:10.1111/j.1365-3156.2004.01276.x

Ramesh, B. M., Moses, S., Washington, R., Isac, S., Mohapatra, B., Mahagaonkar, S. B., … Blanchard, J. F. (2008). Determinants of HIV prevalence among female sex workers in four south Indian states: analysis of cross-sectional surveys in twenty-three districts. *AIDS (London, England)*, *22 Suppl 5*, S35–44. doi:10.1097/01.aids.0000343762.54831.5c

Smith-Estelle, A., & Gruskin, S. (2003). Vulnerability to HIV/STIs among rural women from migrant communities in Nepal: a health and human rights framework. *Reproductive Health Matters*, *11*(22), 142–51. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/14708405

Thapa, S., Bista, N., Timilsina, S., Buntinx, F., & Mathei, C. (2014). Social and behavioral risk factors for HIV infection among the wives of labor migrants in Nepal. *International Journal of STD & AIDS*, (January). Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/24469967

UNAIDS. (2007). *AIDS epidemic update*.

UNAIDS. (2008). *Report on the global AIDS epidemic*.

Young, S. D., & Bendavid, E. (2010). The relationship between HIV testing, stigma, and health service usage. *AIDS Care*, *22*, 373–380. doi:10.1080/09540120903193666

FIGURE 1 Framework for Vulnerability of Wives of Labor Migrants to HIV Infection

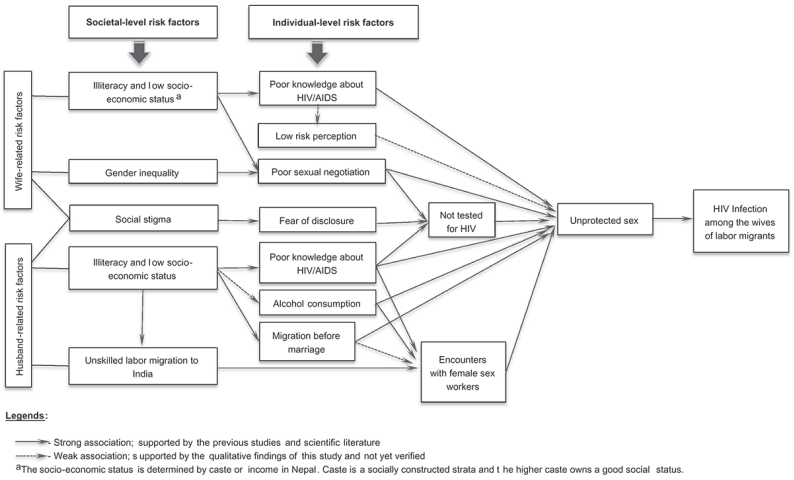

TABLE 1 Coding Tree

Broad themes	Sub-themes	Codes		
		Wife-related	Husband-related	Sex-independent
Societal-level risk factors	Illiteracy and low socio-economic status	- Poverty; - Low level of literacy; - Low payment; - Possibilities of survival sex; - Husband as the only source of income	- Lack of regional jobs; - Poor educational level	- Poverty in the region
	Gender	- Domination of men in every aspect of	- Perception that women are	

	inequality	daily life; - Lack of support from government to women's right; - Physical violence; - Difficulties to express their voice towards husbands; - No organization at local level to help; - Lack of support from husbands	dumb	
	Social Stigma	- Higher degree of discrimination on HIV infected women inside family and society; - Women living with HIV are isolated; - No care for the women living with HIV;		- Social stigma attached with HIV positive status; - Discrimination of the children of HIV infected couples in schools

		- Blame for transmitting HIV		
Individual-level risk factors	Poor knowledge about HIV/AIDS	- Lack of awareness about HIV and safe sex; - Aware of risky sexual behavior of men abroad; - Aware of high percentage of alcohol use amongst men; - Lack of knowledge on: blood-to-blood contact causes HIV transmission, if husband and wife have unprotected sex could transmit HIV, sex without a condom causes HIV	- Lack of knowledge on how to use a condom	- No awareness about HIV and condom use; - Little effect of media campaigns
	Low Risk perception	- Do not doubt their husband's behavior; - Feeling of at low risk;		

		- Perception that husband are faithful; - Perception that husband should not be trusted; - Deceived by husband		
	Fear of disclosure and late testing	- Doctors request for test (non-voluntary testing); - HIV test during pregnancy; - HIV test during minor illnesses; - Tested only after the husband is tested positive	- Deceive wives lying about test result; - Do not want to test for HIV; - Do not care about wives; - Tested very late; - Non-disclosure of HIV status to wives	-

	Unprotected sex	- Preference of Depo-Provera instead of condom for family planning	- Visiting brothels in India; - Do not want to use condoms; - Perception that condom reduces sexual pleasure	- Unprotected sex between husband and wife; - HIV infected couple are giving birth to babies; - Condoms might be unavailable in rural corners; - Condom available for free

TABLE 2 Socio-demographic Characteristics of the Participants

	Cases (n=112)		Controls (n=112)		*p* value
	Number	Percent	Number	Percent	
Caste of the women					
Lower	68	60.7	48	42.9	0.007
Upper	44	39.3	64	57.1	
Literacy of the women					
Illiterate	103	92.0	74	66.1	<0.001
Literate	9	8.0	38	33.9	

Occupation of the women					
Farming	99	88.4	98	87.5	0.830
Non-Farming	13	11.6	14	12.5	
Income from agriculture					
No production	13	11.6	11	9.8	0.001
Enough for less than six months	67	59.8	44	39.3	
Enough for more than six months	32	28.6	57	50.9	
Alternative sources of income					

Yes	42	37.5	81	72.3	<0.001
No	70	62.5	31	27.7	
Type of family					
Nuclear	83	74.1	63	57.2	0.008
Joint	29	25.9	48	42.8	
Marital status of the women					
Widowed	77	68.8	9	8.0	<0.001
Not-widowed	35	31.2	103	92.0	

Aware about the cause of death of the husbands					
Yes	70	90.9	6	66.7	0.010
No	7	9.1	3	33.3	
Cause of death of the husbands					
AIDS-related illness	64	91.4	2	33.3	<0.001
Others	6	8.6	4	66.7	

TABLE 3 HIV-related Knowledge and Behavior of the Participants

	Cases (n=112)		Controls (n=112)		*p* value
	Number	Percent	Number	Percent	
Heard about HIV					
Yes	43	38.4	87	77.6	<0.001
No	69	61.6	25	22.4	
Knowledge about prevention through abstinence					
Yes	10	23.2	67	77.0	<0.001
No	33	73.8	20	23.0	

Knowledge about prevention through being faithful to only one partner					
Yes	10	23.3	57	65.5	<0.001
No	33	76.7	30	34.5	
Knowledge about prevention through using a condom					
Yes	13	30.2	56	64.4	<0.001
No	30	69.8	31	35.6	
Knowledge about transmission by sharing needles					
Yes	14	32.5	66	75.8	<0.001

No	29	67.5	21	24.2	
Knowledge about transmission through blood transfusion					
Yes	13	30.2	68	79.3	<0.001
No	30	69.8	19	20.7	
Knowledge about transmission from infected mother to child					
Yes	8	18.6	56	64.4	<0.001
No	35	81.4	31	35.6	
Heard about a Condom					

Yes	31	27.7	94	83.9	<0.001
No	81	72.3	18	16.1	
Knowledge about properly using a condom					
Yes	17	54.8	57	60.6	0.569
No	14	45.2	37	39.4	
Heard about STIs					
Yes	31	27.7	48	42.9	0.017
No	81	72.3	64	57.1	

Any close relatives who died of HIV/AIDS					
Yes	27	62.8	41	47.1	0.019
No	16	37.2	46	52.9	
Keep whether someone was infected with HIV in the family a secret					
Yes	4	9.3	1	1.1	<0.001
No	13	13	67	77	
Don't know	26	26	19	21.8	
Take care of someone infected with HIV in the family					

Yes	14	32.6	62	71.3	<0.001
No	3	7.0	2	2.3	
Don't know	26	60.5	23	26.4	
Risk perception of HIV					
Yes	7	16.3	37	42.5	<0.001
No	5	11.6	24	27.6	
Don't know	31	72.1	26	29.9	
Age at first sexual intercourse					

Before 18 years of age	96	85.7	79	70.5	0.006
18 years or after	16	14.3	33	29.5	
Duration of sexual activity					
Less than 10 years	27	24.1	51	45.5	0.010
10 years and more	85	75.9	61	54.5	
Opinion regarding an HIV test					
Should be voluntary	57	50.9	93	83.0	<0.001
Should be mandatory	55	49.1	19	17.0	

Last sexual intercourse					
With husband	107	95.5	112	100.0	0.024
With other men	5	4.5	0	0.0	
Ever using a condom with husband					
Yes	3	2.7	22	19.7	<0.001
No	109	97.3	90	80.3	

STIs, sexually transmitted infections

TABLE 4 Migratory Information of the Husbands

	Cases (n=112)		Controls (n=112)		*p* value
	Number	Percent	Number	Percent	
Literacy Status					
Illiterate	60	53.6	21	18.8	<0.001
Literate	52	46.4	91	81.2	
Migration before marriage					
Yes	88	78.6	46	41.1	<0.001
No	24	21.4	66	58.9	

Age when going abroad for the first time					
Less than 16 years	15	13.4	15	13.4	<0.001
16 to 24 years	27	24.1	55	49.1	
25 to 32 years	5	4.5	20	17.9	
32 years and more	65	58.0	22	19.6	
Income abroad (per day)					
Less than $ 2.60	93	83.0	82	73.2	0.075
$ 2.60 and more	19	17.0	30	26.8	

Type of work done abroad					
Watchman	86	76.8	61	54.4	<0.001
Driver/Automobile cleaner	4	3.6	6	5.4	
Hotel staff	4	3.6	17	15.2	
Industry/Factory worker	4	3.6	18	16.1	
Don't know	14	12.4	10	8.9	
Alcohol consumption					
Yes	82	73.2	21	18.8	<0.001

No	30	26.8	91	81.2	
Country of migration					
India	101	90.2	77	68.8	<0.001
Other than India	11	9.8	35	31.2	
Living status abroad					
Alone	53	47.3	22	19.7	<0.001
With friends	17	15.2	17	15.2	
With relatives	14	12.5	53	47.3	

With family members	9	8.0	11	9.8	
With others	19	17.0	9	8.0	
Having an unpaid sexual partner abroad					
Yes	32	28.6	7	6.2	<0.001
No	80	71.4	105	93.8	

TABLE 5 Hierarchical Conditional Logistic Regression Analysis of Wife and Husband-related Factors with HIV Positive Status of the Women

	Odds Ratio (95% CI)			
	Unadjusted	Adjusted[a]	Adjusted[b]	Adjusted[c]
Caste of the women (Lower/upper)	2.06 (1.21-3.51)	2.26 (1.22-4.20)	2.78 (1.38-5.58)	2.67 (1.14-6.27)
Literacy of the women (Illiterate/literate)	5.87 (2.67-12.98)	4.35 (1.88-10.10)	NS	-
Income of the women (Lower/higher)	6.56 (3.66-11.77)	5.99 (3.22-11.14)	6.36 (3.12-12.95)	4.04 (1.74-9.34)
Type of family (Nuclear /joint)	2.14 (1.22-3.77)	NS	-	-
Knowledge about HIV/AIDS (No Knowledge/some knowledge)	11.50 (5.83-22.67)	-	14.71(5.88-36.76)	3.67 (1.33-10.07)

Knowledge about a condom (No knowledge/some knowledge)	5.81 (3.10-10.87)	-	NS	-
Heard about STI (No/yes)	1.96 (1.12-3.42)	-	0.38 (0.16-0.94)	NS
Age at first sexual intercourse of the women (Below 18 years/18 years or above)	2.50 (1.28-4.88)	-	NS	-
Duration of sexual activity (Less than 10 years/10 years or more)	0.38 (0.21-0.67)	-	NS	-
Literacy of the husbands (Illiterate/literate)	5.00 (2.73-9.13)	-	-	NS
Migration before marriage (Yes/no)	5.26 (2.92-9.46)	-	-	6.69 (2.70-16.54)
Husbands' age when going abroad for the first time (24 years or above/below 24 years)	2.77 (1.61-4.77)	-	-	NS
Husbands' income abroad per day (Less than $ 2.60/$ 2.60 or	1.79 (0.93-3.41)	-	-	NS

more)				
Husbands' country of migration (India/others)	4.17 (1.99-8.74)	-	-	4.42 (1.45-13.47)
Type of work done abroad (Others/watchman)	0.36 (0.20-0.64)	-	-	NS
Husbands' living status abroad (Alone/others)	3.67 (2.02-6.66)	-	-	NS
Husbands having an unpaid sexual partner abroad (Yes/no)	6.00 (2.51-14.29)	-	-	NS
Alcohol consumption by the husbands (Yes/no)	11.84 (6.29-22.29)	-	-	8.01 (3.47-18.51)

[a] Model 1: Women's caste, literacy; income; and type of family.

[b] Model 2: Model 1; plus knowledge about AIDS; knowledge about a condom; heard of STI; women's age at first sexual intercourse; and duration of sexual activity.

[c] Model 3: Model 2, plus literacy of the husbands; migration before marriage; husbands' age when going abroad for the first time; husbands' income abroad; country of migration; type of work done abroad; living status abroad; having an unpaid partner abroad; and alcohol consumption.

The *p* values for the Hosmer and Lemeshow goodness-of-fit tests for Models 1, 2 and 3 were 0.61, 0.61 and 0.14, respectively, and the accuracy between the predicted and observed values were 72.8%. 77.2% and 87.1%, respectively.

CI, Confidence interval

NS, Not significant

STI, Sexually transmitted infection